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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,404	06/30/2003	Claus Hoffjann	4532	1920

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EXAMINER

FORTUNA, ANA M

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/611,404

Applicant(s)

HOFFJANN ET AL.

Examiner

Ana M. Fortuna

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 8 is incomplete as to what parameters of the emulsion are monitored.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-15, 18, 25, are rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al (6,736,867)(Hereinafter '867). Reference '867 discloses a process in which distilled water or deionized water, e.g. filtered water, is used in a mixture with hydrocarbon fuel in the formation of an emulsion to be used as fuel for a high temperature fuel cell (abstract, column 1, lines 30-50, column 4, lines 43-50). The original water can be produced by the fuel cell, e.g. condensed water (column 1, lines 17-28). Starting from waste is not clearly disclosed in '867, however, purified water by conventional treatment is suggested e.g. ion exchange or distillation.

It would have been obvious to one skilled in the art at the time the invention was made to form the emulsion with water of equivalent compositions, e.g. highly purified

water, in the process of preparing the emulsion as fuel for the fuel cell, based in reference '867 suggestion of using distilled water.

As to claim 2, using reactors converting the hydrocarbons to produce hydrogen in the fuel cell, the use of conventional fuel cells is disclosed in the reference (column 2, lines 4-35).

As to claims 3 and 25, using hydrocarbon fuel with low sulfur content or no sulfur content is disclosed in '867 (column 4, lines 28-39). It would have then been obvious to one skilled in the art to remove the sulfur or to select a sulfur free fuel, e.g. kerosene, or emulsion with water as feed to the fuel cell.

Regarding claim 4-7, the process of forming the emulsion including mixing and vibrating with a sonic vibrator and within a container is disclosed in '867 (column 3, lines 5-23, column 5, lines 22-68 and column 6, lines 1-2).

As to claims 8, 11, 12, 13, controlling the emulsion with a microprocessor which signal initiates the dispensing of the emulsion components, is also disclosed in the reference (column 3, lines 59-63), parameters such as conductivity, which determines emulsion continuity is detected during the control process (column 7, last two lines). Regarding claim 9, alternative use of hydrocarbon (containing hydrogen) as start up for the fuel cell or using the emulsion to avoid corrosion of metal surfaces in the performer (catalytic chamber), is also suggested (column 6, line 62 –68, and column 7, lines 1-14). It would have been obvious to one skilled in the art at the time the invention was made to use methane as the initial feed to the fuel cell, or alternatively use the emulsion as disclosed in '867.

The limitations of claims 14-15 are also disclosed (see column 7, second paragraph, column and column 2, lines 25-35), e.g. the reactions in the reactor of reformer including the catalyst to perform the cracking to form hydrogen).

Regarding claim 18, the process of removing the sulfur does not seem to be critical to the process, therefore, the sulfur can be removed by any conventional process, and the hydrocarbon fuel provide in the emulsion composition "free of sulfur", as suggested in '867 (discussed above).

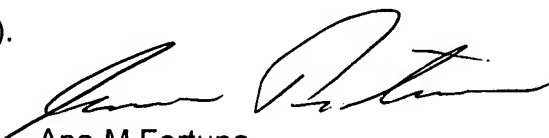
3. Claims 16-17, 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al (6,736,869) as applied to claims 1-15 and 18, 25 above, and further in view of Hsu et al (5,747,185) and Applicant's admissions. The separation of sulfur in the fuel cell and the electrochemical treatment as claimed in the above claims is not disclosed or suggested in '867. Reference '867 suggests using the emulsion of water and hydrocarbon fuel in any conventional fuel cell, as disclosed in the paragraph above. Reference '185 teaches fuel cells including the electrochemical treatment chamber and sulfur removal process, and the fuel cell including additional chamber or housing for sulfur removal is also disclosed (Figures 1 and 5, and column 8, lines 1-59). Applicant also admits using high temperature fuel cells for the process (specification page 5, last paragraph bridging page 6). It would have been obvious to one skilled in the art at the time the invention was made to prepare and use a water and fuel emulsion as disclosed in '867, and used as suggested, e.g. fro feed to fuel cells conventional in the art, such the one disclosed in '185, e.g. to improve the cracking and hydrogen production process in the fuel cell.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference 6,910,536 is cited as teaching the use of fuels, such as methane, produced in a hydrocarbon containing formation for feeding fuel cells (column 16 and column 30, fifth paragraph). Additional references are directed to compositions for fuel cells.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M. Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ana M Fortuna  
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Art Unit 1723